

## **CLAIMS**

### **What is claimed is:**

1. A method for debugging software objects within a grid environment comprising the steps of:
  - identifying a host, wherein said host is a software object;
  - associating a ghost agent with said host;
  - replicating actions executed by said host for use by said ghost agent;
  - debugging said host based upon said replicated actions; and,
  - moving said ghost agent from one grid within said grid environment to another grid.
2. The method of claim 1, further comprising the steps of:
  - moving said host from one grid within said grid environment to another grid; and,
  - responsively moving said ghost agent in accordance with movement of said host.
3. The method of claim 1, wherein said actions executed by said host are executed within a production environment, said method further comprising the step of preventing said replicated actions from operationally executing in said production environment.
4. The method of claim 1, wherein said debugging step further comprises the steps of:
  - receiving a debugging command;
  - executing said debugging command; and
  - responsively generating at least one debugging message.
5. The method of claim 4, further comprising the steps of:
  - determining a location that is external to said ghost agent; and,
  - conveying said debugging messages to said determined location.
6. The method of claim 1, said debugging step further comprising the steps of:
  - identifying a parameter defined within said host; and,

determining a value for said parameter using said ghost agent.

7. The method of claim 6, said debugging step further comprising the steps of:  
determining said value for said parameter before one of said replicated actions is executed; and,  
determining a value for said parameter after said replicated action is executed.
8. The method of claim 1, said debugging step further comprising the steps of:  
determining a processing break point for at least one of said replicated actions;  
and,  
halting execution of said replicated action at said processing break point.
9. The method of claim 8, said debugging step further comprising the step of  
determining at least one parameter value occurring at said processing break point.
10. The method of claim 1, said debugging step further comprising the steps of:  
stepping the execution of at least a portion of said replicated actions; and,  
for each execution step, determining at least one parameter value.
11. The method of claim 1, further comprising the steps of:  
selecting a plurality of hosts; and,  
for each selected host, repeating said associating step, said replicating step, and  
said debugging step.
12. The method of claim 11, wherein said selected hosts are utilized within an  
application domain, said method further comprising the step of debugging said  
application domain.
13. The method of claim 12, wherein said hosts are disposed within different grids of  
said grid environment, said method further comprising the step of:

providing an interface for debugging said application domain, wherein said interface is configured to debug said hosts regardless of which grid said hosts are disposed within.

14. A debugger comprising:

a plurality of hosts, wherein said hosts are software objects for an application domain distributed within different grids of a grid environment;

at least one ghost agent configured to be associated with a selected one of said hosts, wherein said ghost agent is further configured to debug said associated host; and,

an interface for debugging said application domain, wherein said interface conveys debugging commands to said ghost agents and responsively receives debugging messages.

15. The debugger of claim 14, wherein at least a portion of said hosts move from one grid within said grid environment to another grid, and wherein said ghost agents responsively move from grid to grid in accordance with movement of said associated host.

16. The debugger of claim 14, further comprising:

a debugging data store configured to record said debugging messages from a plurality of said ghost agents.

17. The debugger of claim 16, further comprising:

a debugging analyzer configured to analyze data within said debugging data store.

18. A ghost agent comprising:

a ghost controller for managing interactions between said ghost agent and a grid environment, wherein said ghost agent automatically moves from grid to grid within a grid environment to follow movements of a host;

means for debugging said host using said ghost agent; and,  
a ghost log configured to record debugging messages.

19. The ghost agent of claim 18, further comprising an interface for associating said ghost agent with said host.

20. The ghost agent of claim 18, further comprising a ghost identifier configured to identify said ghost agent to components within said grid environment.

21. The ghost agent of claim 18, further comprising:  
means for disassociating said ghost agent from said host; and,  
means for associating said ghost agent with a different host.

22. A machine-readable storage having stored thereon, a computer program having a plurality of code sections, said code sections executable by a machine for causing the machine to perform the steps of:

identifying a host, wherein said host is a software object;  
associating a ghost agent with said host;  
replicating actions executed by said host for use by said ghost agent;  
debugging said host based upon said replicated actions; and,  
moving said ghost agent from one grid to within said grid environment to another grid.

23. The machine-readable storage of claim 22, further comprising the steps of:  
moving said host from one grid within said grid environment to another grid; and,  
responsively moving said ghost agent in accordance with movement of said host.

24. The machine-readable storage of claim 22, wherein said actions executed by said host are executed within a production environment, said method further comprising the step of preventing said replicated actions from operationally executing in said production environment.

25. The machine-readable storage of claim 22, wherein said debugging step further comprises the steps of:

- receiving a debugging command;
- executing said debugging command; and
- responsively generating at least one debugging message.

26. The machine-readable storage of claim 25, further comprising the steps of:  
determining a location that is external to said ghost agent; and,  
conveying said debugging messages to said determined location.

27. The machine-readable storage of claim 22, said debugging step further comprising the steps of:

- identifying a parameter defined within said host; and,
- determining a value for said parameter using said ghost agent.

28. The machine-readable storage of claim 27, said debugging step further comprising the steps of:

- determining said value for said parameter before one of said replicated actions is executed; and,

- determining a value for said parameter after said replicated action is executed.

29. The machine-readable storage of claim 22, said debugging step further comprising the steps of:

- determining a processing break point for at least one of said replicated actions;
- and,

- halting execution of said replicated action at said processing break point.

30. The machine-readable storage of claim 29, said debugging step further comprising the step of determining at least one parameter value occurring at said processing break point.

31. The machine-readable storage of claim 22, said debugging step further comprising the steps of:

stepping the execution of at least a portion of said replicated actions; and,  
for each execution step, determining at least one parameter value.

32. The machine-readable storage of claim 22, further comprising the steps of:

selecting a plurality of hosts; and,  
for each selected host, repeating said associating step, said replicating step, and said debugging step.

33. The machine-readable storage of claim 32 wherein said selected hosts are utilized within a common application domain, said method further comprising the step of debugging said application domain.

34. The machine-readable storage of claim 33, wherein said hosts are disposed within different grids of said grid environment, said method further comprising the step of:

providing an interface for debugging said application domain, wherein said interface is configured to debug said hosts regardless of which grid said hosts are disposed within.

35. A system for debugging software objects within a grid environment comprising the steps of:

means for identifying a host, wherein said host is a software object;  
means for associating a ghost agent with said host;  
means for replicating actions executed by said host for use by said ghost agent;  
means for debugging said host based upon said replicated actions; and,  
means for moving said ghost agent from one grid to within said grid environment to another grid.